

CLMPTO

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CLAIMS 1-20 HAS BEEN CANCELED

21. An ignition actuation mechanism for a lighter for generating discharge voltage that causes a spark of electrical current between ignition electrodes to ignite fuel gas when an actuation member is pressed including:

a first elastic member positioned to resist actuation movement of the actuation member having:

a first spring rate; and

a second elastic member positioned in parallel with said first elastic member to resist actuation movement of the actuation member having:

a second spring rate higher than said first spring rate, said second elastic member being positioned for engagement to resist actuation movement of the actuation member only after more than half of the actuation movement of said first elastic member, whereby the effective spring rate to resist pressing movement of the actuation member sharply increases during the ignition actuation.

22. The ignition actuation mechanism as defined in claim 21 including:

a piezoelectric mechanism for generating the discharge voltage having:

an actuation end; and

the actuation member, said actuation member being slidably mounted to operate said actuation end.

23. The ignition actuation mechanism as defined in claim 21 wherein said second elastic member engages to resist actuation movement of the actuation member when 40% to 10% of the actuation movement remains.

24. The ignition actuation mechanism as defined in claim 23 wherein the maximum force to resist the actuation operation caused by the combined first and second spring rates is 30N to 50N.

25. The ignition actuation mechanism as defined in claim 22 wherein said second elastic member engages to resist actuation movement of the actuation member when 40% to 10% of the actuation movement remains.

26. The ignition actuation mechanism as defined in claim 25 wherein the maximum force to resist the actuation operation caused by the combined first and second spring rates is 30N to 50N.

27. The ignition actuation mechanism as defined in claim 22 wherein said second elastic member includes:

torsion plates integrally formed with said actuation member.

28. The ignition actuation mechanism as defined in claim 27 wherein said second elastic member includes:

torsion plates acting on said actuation member.

29. The ignition actuation mechanism as defined in claim 26 wherein said actuation member and said torsion plates are integrally molded from polyacetal resin.

30. The ignition actuation mechanism as defined in claim 28 further including:

a holder member integrally formed with said second elastic member and positioned separate from said actuation member during an early portion of the actuation movement of said actuation member.

31. The ignition actuation mechanism as defined in claim 30 wherein said holder member and said torsion plates are integrally molded together from polyacetal resin.

32. A spark ignition actuation mechanism for a lighter to ignite fuel gas when an actuation member is pressed including:

a first elastic member positioned to resist pressing movement of the actuation member having:

a first spring rate; and

a second elastic member positioned to act in parallel with said first elastic member to resist pressing movement of the actuation member having:

a second spring rate higher than said first spring rate, said second elastic member being positioned for engagement to resist pressing movement of the actuation member after a first portion of the pressing movement has occurred, whereby the effective spring rate to resist pressing movement of the actuation member increases sharply during a second later portion of the pressing movement.

33. The spark ignition actuation mechanism as defined in claim 32 including:

a piezoelectric mechanism for generating the spark having:

an actuation end; and

the actuation member, said actuation member being slidably mounted to operate said actuation end.

34. The spark ignition actuation mechanism as defined in claim 33 wherein said second elastic member engages to resist actuation movement of the actuation member when 40% to 10% of the actuation movement remains.

35. The spark ignition actuation mechanism as defined in claim 33 wherein the maximum force to resist the actuation operation caused by the combined first and second spring rates is 30N to 50N.

36. The spark ignition actuation mechanism as defined in claim 33 wherein said first elastic member is positioned as part of said piezoelectric mechanism.

37. The spark ignition actuation mechanism as defined in claim 32 wherein said second elastic member is at least one flexible finger integrally formed with said actuation member.

38. The spark ignition actuation mechanism as defined in claim 37 wherein said actuation member and said at least one flexible finger are integrally molded from polyacetal resin.

39. The spark ignition actuation mechanism as defined in claim 32 wherein said second elastic member is at least one flexible finger positioned for acting on said actuation member.

40. The spark ignition actuation mechanism as defined in claim 39 further including:

a holder member integrally formed with said second elastic member and positioned separate from said actuation member during an early portion of the actuation movement of said actuation member, wherein said holder member and said at least one flexible finger are integrally molded together from polyacetal resin.